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Authors of papers intended for publication in FOOD TECHNOLOGY should request from the Editor's office a copy of a booklet, titled "Suggestions to Authors," and see that their papers are in the form specified therein before they are sent to the editor.

The Institute of Food Technologists assumes no responsibility for statements in contributed articles appearing in FOOD TECHNOLOGY. Editorials present only opinions of the writers and do not necessarily reflect policies of the Institute of Food Technologists.

Abstracts

(Continued from page 6)

Good quality jellies were produced from the condensate obtained from the discharge line of a commercial steam blancher, in a frozen apple line, while the varieties York Imperial, Stayman Winesap, Albermarle Pippin, and Black Twig apple slices were successively blanched. These original condensates varied, depending upon the variety, from a pH 3.2 to 3.7 and in degrees Brix of 4.0 to 5.0. When the condensate was concentrated to approximately one-third of its original volume, the pH tended to be higher, especially with the variety Albermarle Pippin, possibly by a loss of volatile acids. When the condensates were made into a 65° Brix sugar jelly (a) without concentration, (b) concentration to two-thirds of original volume, and (c) concentration to one-third of original volume, a good flavored apple jelly, clear and of variable color, ranging from light tint of yellow with Albermarle Pippin, to pink and deep red, depending upon the redness of the variety, well flavored, good quality jellies, developed. It is believed that jelly superior to that of 'cider jelly' can be made by utilizing the condensate from steam-blanching lines in frozen apple processing, and that such jelly would find much appeal to the commercial trade. At the present time, such jellies would have to be labeled as 'spreads' pending a possible change in the definition of standards of the Pure Food and Drug Administration.

364J. Confirming the formation of pectin gels in the cold.
DEUEL, H., AND EGGENBERGER, W. *Kolloid-Z., 117,* 97-102, May, 1950 (in German).

Gels have been made in the cold way, and the effect of standing at various low temperatures studied. Intermediate temperatures of around 25° C. produced the firmest gels. Higher or lower temperatures produced less firm gels. Additional studies have been made varying the esterification of the pectin, the sugar and acid concentrates.

PATENTS

BAKERY PRODUCTS

365J. Process of retarding stiffening of bread.
JOHNSTON, N. F. 2,509,926, May 30, 1950.

In the preparation of yeast-raised bakery products, the method of decreasing rate of staling which comprises mixing into the dough a small amount of a material selected from the group consisting of reaction products of a polyhydroxy compound and an alkylene oxide which have been partially esterified with a straight chain monocarboxylic acid having at least 12 carbon atoms and reactions products of an alkylene oxide and a partial ester of a polyhydroxy compound and a straight-chain mono-carboxylic acid having at least 12 carbon atoms.

366J. Process of retarding stiffening of bread.
JOHNSTON, N. F. 2,509,927, May 30, 1950.

In the preparation of starch-containing, yeast-raised bakery products, the improvement which comprises incorporating a polyoxyethylene monoester of a higher fatty acid in the dry mix in an amount approximately 0.1 to 3.5% by weight of the flour where the ester contains a molar ratio of ethylene oxide radicals to fatty acid in the range of 6:1 to 16:1.

CEREALS AND GRAINS

367J. Method of sterilizing corn products.
BALL, C. O. Assignor to The United Products Company, 2,502,197, Mar. 28, 1950.

The process of sterilizing a corn product containing 30 to 65% of corn kernels selected from the class consisting of whole corn kernels and parts of whole corn kernels and the remainder a sauce containing 8 to 90% of finely divided corn grains in added water, said process comprising sterilizing said product in a container while said added water contains not more than 35% of its weight of said finely divided corn grains, and while said corn kernels and the remainder of said finely divided corn grains are substantially stratified in layers.

368J. Tapioca process.
OLSEN, A. G. Assignor to General Foods Corporation, 2,508,533, May 23, 1950.

The process of producing granular products from starch of the group consisting of tapioca and waxy starches for use in the preparation of puddings which comprises gelatinizing, drying and comminuting the starch into particles small enough to pass a 14-mesh screen, adding water to a mass of such particles and stirring the mass to cause the particles to unite into agglomerates, substantially less than the weight of the starch, the amount of water being to avoid substantial swelling of the particles but being distributed on the surfaces of the particles to cause surface stickiness whereby porous agglomerates are formed, and then drying the porous agglomerates.

369J. Process of producing flour.
BROWN, D. H. 2,509,418, May 30, 1950.

The process of producing germ flour from wheat berries having germ, aleurone and endosperm portions and an outer bran layer which comprises selecting berries which have been aged at least ninety days out of the field, tempering the berries from four to six hours with water and maintaining the temperature of the berries at 60° to 80° F. during the tempering, passing the berries through a plurality of break and reduction rolls of which the break rolls have been separated sufficiently to pass the germ in its normal form and of which the reduction rolls have been separated sufficiently to reduce the germ, aleurone and endosperm to flour fineness, and maintaining the berries at a temperature below approximately 85° F. from a time at least subsequent to tempering and prior to the delivery of the berries to the first break rolls and until the process is terminated and including aeration of the berries during passage thereof through the break and reduction rolls.

370J. Production of bran-containing food products.
RAYMER, M. M., AND THOMPSON, J. J. Assignors to Kellogg Co. 2,509,449, May 30, 1950.

The method of treating bran in the preparation of food products therefrom which comprises cooking the bran in admixture with barley malt sprouts separated from the grain. A ready-to-eat breakfast cereal type wheat bran food product of palatable character composed of wheat bran in admixture with a minor proportion of dried barley malt sprouts separated from the grain.

371J. Process for aging flour.
SILVER, M. L. 2,510,146, June 6, 1950.

The method of treating finely comminuted cereal products for effecting aging thereof, which comprises intimately contacting the product to be treated to a gaseous chloramine-containing atmosphere selected from the group consisting of monochloramine and dichloramine and any mixtures thereof.

372J. Separation of the starch and gluten constituents of flour.
HARRELL, C. G., HAIGH, J. T., AND BROWN, R. O. Assignors to Pillsbury Mills, Inc. 2,516,117, July 25, 1950.

The process of separating gluten from wheat flour which consists in adding from one-fourth percent to three and one-half percent by weight sodium thiosulfate to the flour, mixing the flour to which the sodium thiosulfate has been added with a quantity of water sufficient to form a dough but not in excess of that required to form a batter, thereafter washing the preparation with a large quantity of water while agitating the same and removing the wash water containing the starch from the gluten.

COFFEE

373J. Methylation of xanthine to form caffeine.
DECKER, W. E. Assignor to Technical Specialties Company. 2,509,084, May 23, 1950.

A process for the synthesis of caffeine which comprises converting guanine to xanthine by treatment with hydrochloric acid, and then, in the same reaction vessel and without recovering the xanthine from the resulting solution, neutralizing the excess acid to bring the pH of the solution to 6.5 to 7.0, methylating the xanthine in the resulting solution with acetone

(Continued on page 10)

Some use Christmas bells...

Some use Christmas holly...

Some use a fat Santa Claus,
Round, red, and jolly...

But our wish takes all of them,
See? They're all here—
To say...

MERRY CHRISTMAS!

And a BRIGHT GOOD next year!

Norda ESSENTIAL OIL AND CHEMICAL COMPANY, INC., 601 West 26th Street, New York 1, N. Y.

CHICAGO • LOS ANGELES • ST. PAUL • MONTREAL • TORONTO • HAVANA • MEXICO CITY • LONDON • PARIS

Abstracts

(Continued from page 8)

and methyl acetate, priming the resulting caffeine solution with a compound selected from the group consisting of methyl oxalate and caffeine, and separating caffeine from the solution by crystallization.

374J. Coffee extraction process.

ORNFELT, J. Assignor, by mesne assignments, to American Home Foods, Inc. 2,515,730, July 18, 1950.

In a coffee extraction process in which ground roasted coffee is extracted in a series of stages with water at an elevated temperature in the range of 125°-150° C. to produce a highly concentrated coffee extract, the further step of using said extract in the approximate temperature range 25°-15° C. to extract unextracted ground roasted coffee.

375J. Process of preparing coffee extract.

BACOT, P. A. Assignor to Societe Immobiliere & Financiere du Parc. 2,522,014, Sept. 12, 1950.

In the production of a coffee extract, the steps of distilling an aqueous suspension of ground, roasted coffee beans under a sub-atmospheric pressure, at a temperature not above 42° C., thus producing vapors; condensing vapors until a weight of condensed liquid substantially equal to the weight of starting coffee has been collected and thereupon terminating distillation; and extracting the remainder of aqueous suspension with water at a temperature of about 90-95° C.

376J. Method of making water-soluble coffee extract.

SCHAEPPI, J. H. MITLODI, AND MOSIMANN, W. 2,518,441, Aug. 15, 1950.

In a process of making a dehydrated water-soluble coffee-extract, the steps comprising extracting roasted and ground coffee at a temperature not exceeding 100° C. with water containing a sufficient amount of a substance capable of binding and precipitating the albuminous and albuminlike substances which would impair the taste of the dehydrated extract, said binding and precipitating substances being selected from the group consisting of calcium hydroxide and calcium oxide, filtering said extract, adding to the filtered solution a mixture comprising lactose and gum-arabic as an aroma-retaining medium in an amount of 40 to 60% based on the total weight of the final dehydrated extract, adjusting the pH value of said solution to within a range between 4.7 and 5.4 by addition of an innocuous organic acid selected from the group consisting of tartaric acid and citric acid, thereafter dehydrating said solution and admixing the dry dehydrated extract powder with 0.4-0.8% of its total weight of an aromatic oil, obtained by squeezing roasted coffee powder.

ENRICHMENT

377J. Enriched foodstuffs.

STIEVATER, JR., L., AND STECHER, P. Assignors to Merck & Co., Inc. 2,508,477, May 23, 1950.

The process of enriching a granular foodstuff with riboflavin, thiamin, niacin and an iron salt which comprises applying to the granules a fluid mixture of riboflavin, abietic acid and acetone and evaporating the acetone to form a coating on the granules consisting of riboflavin suspended in abietic acid, then applying to the granules a fluid mixture of thiamin, niacin, and iron salt, zein, acetone and water and evaporating the water and acetone to form a second coating on the granules consisting of thiamin, niacin and an iron salt, suspended in zein, and finally applying to the granules a fluid mixture of abietic acid and acetone and evaporating the acetone to form an outer coating of abietic acid on the granules.

FATS AND ANTIOXIDANTS

378J. Shortening.

NORTH, G. C., ALTON, A. J., AND BROWN, W. C. Assignors to Beatrice Creamery Co. 2,520,954, Sept. 5, 1950.

A powdered shortening comprising a shortening fat core, a hull of milk solids not fat, and egg substance selected from the group consisting of whole egg and egg yolk, the fat present including shortening fat and egg fat being between 50 and 80 parts, and the amount of egg yolk present in the egg substance being between 10 and 30 parts.

379J. Process of producing an antioxidant concentrate.

BUXTON, L. O. Assignor to Nopco Chemical Co. 2,515,858, July 18, 1950.

In a process for producing an antioxidant concentrate, the steps comprising contacting a crude vegetable oil with ammonia, contacting the ammonia-treated oil with a solvent substantially miscible with fatty materials at room temperature and only partially miscible therewith at temperature somewhat below room temperature, and separating a solvent solution containing a highly active antioxidant extract from the oil immiscible with the solvent at the temperature somewhat below room temperature.

380J. Process of producing an antioxidant concentrate.

BUXTON, L. O. Assignor to Nopco Chemical Co. 2,515,859, July 18, 1950.

In a process for producing an antioxidant concentrate, the steps comprising contacting the ammonia-treated oil with a solvent selected from the group consisting of methanol and ethanol, and separating a solvent containing a highly active antioxidant extract from the oil.

381J. Process of producing an antioxidant concentrate.

BUXTON, L. O. Assignor to Nopco Chemical Co. 2,515,860, July 18, 1950.

In a process for producing an antioxidant concentrate, the steps comprising contacting a crude vegetable oil with ammonia, contacting the ammonia-treated oil with a highly polar solvent selected from the group consisting of isopropyl alcohol, n-propyl alcohol, acetone, diacetone alcohol, ethyl acetate, methyl acetate, and methyl ethyl ketone, said solvents containing at least 10% of water, and separating a solvent solution containing a highly active antioxidant extract from the oil.

382J. Synergistic antioxidant containing amino acids.

HALL, L. A. Assignor to The Griffith Laboratories, Inc. 2,518,233, Aug. 8, 1950.

A fatty composition consisting predominantly of glycerides of fatty acid and containing not substantially more than 0.25% of an antioxidant composition comprising a synergistic mixture of an amino acid compound of the class consisting of glycine, threonine, phenylalanine, arginine, methionine, tryptophane, tyrosine, butyl tyrosine, and alanine; a gallic acid ester and an organic acid of the class consisting of benzoic, fumaric, tartaric and citric.

383J. Antioxidant.

KRAYBILL, H. R., AND BEADLE, B. W. Assignors to Brickman, A. W. 2,521,856, Sept. 12, 1950.

A material normally subject to the deteriorating effect of oxidative rancidity due to its content of glycerides of fatty acids, stabilized by the presence of (a) from .01 to .02% by weight based on the glyceride content of tertiary butylated hydroquinone monoalkyl ether wherein the alkyl group contains from 1 to 4 carbon atoms inclusive; (b) from .002 to .005% by weight of hydroquinone, (c) from .002 to .005% by weight of an acidic material selected from the group consisting of citric acid, ascorbic acid, oxalic acid, phosphoric acid, ethyl acid phosphate and triethyl phosphate.

FISH PRODUCTS

384J. Fish protein and mineral product.

PARGENTJEV, I. A. 2,512,375, June 20, 1950.

The method of treating fish body material containing fish bones which comprises grinding such material and forming the ground material into an aqueous liquid mash capable of being stirred, admixing the ground material with a mineral acid, stirring the resulting mixture and continuing the acid treatment until the fish body pieces are broken up and the bones dissolved and a homogenized mixture is obtained discontinuing the acid treatment before the fish protein is substantially hydrolyzed

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and while the homogenized mixture contains freed fish oils and the fish protein mainly is in the form of acid-insoluble finely divided protein in suspension in an aqueous acid solution of salts resulting from the dissolving of the bones and of soluble nitrogen compounds, and separating from the homogenized mixture a product containing the acid-insoluble protein. A fish protein and mineral product resulting from the limited acid treatment of fish body material including fish bones sufficient to dissolve the fish bones and convert the fish proteins mainly into the form of an acid-insoluble finely divided protein, said product being made up principally of fine particles of acid-modified fish proteins having an acid reaction and being insoluble in dilute acid solution, and a small but substantial amount of readily digestible acid solubilized fish bones intimately admixed therewith, and said product containing enzymes and vitamin B complex.

385J. Process and apparatus for producing oil from fish liver.

SARLAND, K. L. Assignor to Aktiebolaget Separator. 2,507,614. May 16, 1950.

In the treatment of fish liver the process which comprises subjecting a liver mass to a series of successive disintegration actions to disintegrate the liver and remove tendons or connective tissue therefrom, by confining and rotating a mass of the liver about a vertical axis in a primary zone while partially obstructing the mass rotation to cause the inner portion of the mass to rotate at a lower speed than the outer surface of the mass, scraping and cutting off small pieces of the mass near outer surface during rotation and while discharging disintegrated liver from the outer surface of the rotating mass through a plurality of relatively large paths into a secondary zone surrounding first zone, retaining the coarser separated tendon material in primary zone, effecting a similar obstructed rotation of the mass in said secondary zone concurrently with the obstructed rotation in the first zone, and subjecting secondary rotating mass to a finer scraping and cutting near its outer surface while discharging finely disintegrated liver outwardly therefrom through a plurality of paths smaller than first paths.

386J. Machine for conditioning shrimp.

SWINDEN, R. K. 2,515,101. July 11, 1950.

In a machine for conditioning shrimp, a rotatable cutter assembly comprising circular guide discs, a pair of disc-like cutters between discs and a spacer between cutters to space the cutters apart, the margins of the discs converging inwardly to the cutters to guide the shrimp with respect to cutters, cutters terminating in sharp cutting edges which extend out beyond the margins of the discs.

FLAVORS

387J. Process for recovering volatile flavors.

MILLEVILLE, H. P. Assignor of fifty percent to D. K. Tressler. 2,513,813. July 4, 1950.

The process of obtaining a concentrated solution of volatile components from solutions containing such volatiles which consists in passing the solution into the stripping section of a fractionating column while causing a stream of steam to ascend from the lower end of the column to strip the volatiles from the solution, withdrawing the vaporized product from the upper end of the rectifying section of the column and condensing such vapors, passing the non-condensible gases into a scrubbing tower, contacting such gases by a stream of water to absorb the volatile components from the gases, returning such volatile components to the system, and recirculating the condensed vapors through the rectifying section until a desired concentration has been reached.

388J. Flavor developing composition.

SABINE, D. B. Assignor to The Arlington Chemical Company. 2,512,385. June 20, 1950.

A composition of matter, for developing the flavor of food products, comprising a mixture of ammonium glutamate and glutamic acid, the glutamic acid serving to increase the flavor developing property to a level above that for ammonium glutamate alone and above that for glutamic acid alone, the proportion of glutamic acid being 10 to 100 parts for 100 of ammonium glutamate.

FREEZING

389J. Rapid freeze process for food products.

GORTON, JR., T. S. 2,522,221, Sept. 12, 1950.

The method of producing a quick frozen food product in package form which comprises, preforming a container consisting of thin ice walls having smooth inner surfaces, cooling walls to a temperature substantially below the freezing point of water, packing container only with a solid food product to bring the solid food in direct and intimate contact with prefrozen inner surfaces of the container, and then subjecting the so packed container to a quick freezing temperature appropriate to the food to be frozen to quick freeze the contents and to characteristically unite the surfaces of the contents which are in contact with pre-frozen smooth walls to walls by the initial transfer of heat to the frozen walls from the food and the subsequently applied quick freezing temperature to form a unitary package the thin ice walls of which are refrigerated by frozen contents.

FRUIT AND FRUIT JUICES

390J. Method of preparing products for storage and packaged products produced thereby.

COTTON, R. H., AND SCHROEDER, A. L. Assignors to National Research Corp. 2,520,878, Aug. 29, 1950.

The process of preparing citrus fruit juice for storage which comprises subjecting the juice to vacuum desiccation until it is reduced to a solid powder having a moisture content of from 2% to 5% by weight, then hermetically sealing powder in a container free from moisture vapor, together with a desiccant exposed in moisture-absorptive relation to powder but out of physical contact therewith, desiccant acting during long periods of storage to effect removal and absorption of further moisture from powder and to preserve powder against chemical deterioration and caking which would otherwise take place in storage of container at normal temperature.

391J. Citrus fruit product.

BRUCE, J. A. 2,509,904, May 30, 1950.

A citrus fruit product comprising disintegrated meat of citrus fruit segments in thick suspension in citrus juice, disintegrated meat predominantly consisting of individual meat cells and including both intact meat cells and ruptured meat cells.

392J. Citrus juice and removal of volatile oils therefrom.

PULLEY, G. N., AND VELDHUIS, M. K. Assignors to the United States Government. 2,510,138, June 6, 1950.

A method of simultaneously pasteurizing citrus fruit juice and removing volatile oil therefrom comprising rapidly heating raw citrus fruit juice containing volatile oil to a boiling temperature at substantially atmospheric pressure to evaporate from 0.5 to 5% of the juice by passing the juice through a tubular heater, then passing the juice through a chamber in which the juice is held not less than 3 seconds to allow the vapor to bubble through the juice, whereby more of the volatile oil vaporizes from the juice into the bubbles of vapor, and then separating the vapor containing the volatile oil from the liquid juice.

393J. Process of extracting and preserving the original flavors and food value of fruit juices.

HUZENLAUB, E. G. 2,517,569, Aug. 8, 1950.

The method of extracting fruit and vegetable juices and preserving the original flavors and food values thereof which comprises, cutting the foodstuff into strips under a high vacuum, squeezing the juice from the pulp without substantially disintegrating the pulp and skins, separating the juice from the waste skin strips, pulp and any seeds, discharging waste, the skin strips serving as packing means during the discharging step to prevent lessening of the vacuum, and the vacuum serving to extract air dispersed in the juice and to prevent air from later coming in contact therewith, forming, under the same high vacuum, a moving column of juice, column comprising at a

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given moment an upper portion, an intermedite portion and a lower portion, the upper portion comprising a volume at least about six times the volume of the intermediate portion, heating intermediate portion of juice to sterilize the same, permitting any vapor formed during the heating step to condense in the juice comprising upper portion, introducing sterilized and cooled juice from the lower portion of the column into a container and sealing the juice therein, permitting heated juice in the intermediate portion to form a succeeding lower portion and cooling the same, replacing the theretofore intermediate portion of juice by juice from the upper portion, replenishing the upper portion with new juice, and repeating the foregoing steps, protecting the juice against contact with air and oxidizing material at all times from the beginning of the extracting operation until the sealed containers are opened.

394J. Methods of drying foods.

KETCHAM, E. K., MAY, C. F., AND JAGOW, E. E. Assignors, by mesne assignments, to Vacu-Dry Co. 2,522,276, Sept. 12, 1950.

In the process of dehydrating fruits and vegetables wherein the moisture content of the particles is reduced to a maximum of 3% in a sealed vessel with the final drying being accomplished under vacuum of the order of 28½ in. of mercury and with controlled heat, at the conclusion thereof the steps of suddenly restoring atmospheric pressure within the sealed vessel, and thereafter rapidly establishing a pressure within vessel of at least one atmosphere to collapse the particles.

NUTS

395J. Aqueous nut emulsion.

MITCHELL, JR., J. H. Assignor to Stevens Industries, Inc. 2,511,119. June 13, 1950.

An aqueous nut emulsion comprising one part by weight of nut particles suspended in nut oil, said particles being of such size that at least 85% by weight thereof will pass through a standard 325-mesh sieve, while at least 90% will also pass through a standard 200-mesh sieve, and from about one to about ten parts by weight of water.

396J. Stabilized nut butter.

VINCENT, J. F. Assignor to Stevens Industries, Inc. 2,511,136. June 13, 1950.

An improved nut butter comprising a stable, homogeneous mixture of comminuted nuts, an alkalinizing agent in an amount sufficient to impart to said mixture a pH of about 6.5 to about 7.5 and more than 0.2% by weight of the product of a fatty additive of the group consisting of fatty acids of the C_{16} to C_{18} series and fats composed primarily of glycerides of such acids.

PECTIN

397J. Coating of foods with pectinate films.

OWENS, H. S., AND SCHULTZ, T. H. Assignors to the United States of America. 2,517,595, Aug. 8, 1950.

A food package comprising a food encased in an edible envelope of a calcium-alkali pectinate film, said pectinate being derived from pectinic acid having a methoxyl content from 3 to 8%.

STARCH

398J. Starch modification process.

HANSEN, D. W. Assignor to A. E. Staley Manufacturing Company. 2,514,055. July 4, 1950.

In the preparation of thin boiling starch from native starch which comprises contacting the native starch with an aqueous mixture of a mineral acid and hexavalent chromium at a temperature below the pasting temperature of the starch in contact with aqueous mixture and for a time sufficient to increase the alkali fluidity of the contacted starch substantially above the alkali fluidity of the native starch, the improvement which comprises separating the contacted starch from the aqueous solution containing chromium ion, whereby subsequent alkalizing of starch fails to cause appreciable greenish discoloration thereof due to the presence of chromium ion, and thereafter bringing the starch into contact with an alkaline material under such conditions that the starch granules have a pH of not less than about 8, as indicated by the pH of a slurry of the granules in water alone, and are not substantially pasted thereby.

399J. Process of fractionating starch.

SCHOCH, T. J. Assignor to Corn Products Refining Company. 2,515,095. July 4, 1950.

The process of fractionating starch into its A- and B-fractions which comprises effecting a solution of starch, at elevated temperature, in a mixture of water and aliphatic alcohol, cooling the solution to a sufficiently low temperature to effect precipitation of the A-fraction separating the A-fraction, cooling the solution remaining after removal of A-fraction to a sufficiently low temperature to effect precipitation of the B-fraction and separating the B-fraction; alcohol containing from 1 to 5 atoms of carbon and capable of being dissolved in the aqueous phase of mixture to the extent of about 10 to 15 volume % at 0° C. and being present in the system to the extent of about 10 to about 35% of the volume of mixture; the concentration of starch in solution not exceeding about 7%.

400J. Process of fractionating starch.

SCHOCH, T. J. Assignor to Corn Products Refining Company. 2,515,096. July 11, 1950.

The process of fractionating a material from the group consisting of thin boiling starches and white dextrines into its A- and B-fractions, which comprises effecting a solution of material at elevated temperature in a mixture of water and aliphatic alcohol, cooling the solution to a sufficiently low temperature to effect precipitation of the A-fraction, separating the A-fraction, cooling the solution remaining after removal of A-fraction to a sufficiently low temperature to effect precipitation of the B-fraction and separating the B-fraction; alcohol containing from 1 to 5 atoms of carbon and capable of being dissolved in the aqueous phase of mixture to the extent of about 10 to 15 volume % at 0° C. and being present in the system to the extent of about 10 to about 35% of the volume of mixture; the concentration of material in solution not exceeding about 17%.

VEGETABLES

401J. Desulfurization of vegetable foodstuffs.

FLANZY, M. P. P. Assignor to J. M. L. P. Fabre. 2,509,633, May 30, 1950.

A desulfurizing process for vegetables which have been subjected to the action of a sulfurous agent comprising the steps of heating a mass of products to a temperature sufficient to drive off the sulfurous agent; bringing the vapors generated thereby in contact with a relatively cold surface while permitting them to expand; collecting the condensate; and passing it back into the mass of products while substantially keeping it out of contact with vapors.

402J. Treatment of vegetable matter preparatory to dehydration.

BIRDSEYE, C. Assignor to Dehydration, Inc. 2,509,719, May 30, 1950.

In a vegetable dehydration process, the steps of blanching units of vegetable tissue to inactivate their enzyme content, partially dehydrating the units, adding a plasticizing agent to the units and further dehydrating the units with the plasticizer contained therein.

403J. Method of making food products.

ALEXANDER, J. B. 2,512,591, June 27, 1950.

The method of producing a food product which comprises, slicing potatoes, depositing slices of carrot on the potato slices, exerting pressure on the slices to force them into contact and immersing in a hot cooking fluid while held in assembled relation, whereby adherence is effected.

(Continued on page 13 following technical papers)

Abstracts

(Continued from page 13)

404J. Process of treating legumes to enhance coloration preparatory to freezing.

KENWORTHY, JR., J. R. Assignor to John Inglis Frozen Foods Co. 2,520,214, Aug. 29, 1950.

That method preparing fresh vegetables for freezing comprising: immersing the vegetables in an approximately 1% solution of sodium hydroxide for approximately 1 minute at a temperature of the order of 65° to 70° F., removing them from the solution and immediately rinsing them in clear water of a relatively cool temperature.

405J. Process of preparing peanuts.

WHITEHEAD, W. L. 2,510,534, June 6, 1950.

A process of cooking, salting and storing green unshelled peanuts wherein the unshelled peanuts will be cooked, salted and maintained in an edible condition over long periods of time, which includes the steps of placing washed green unshelled peanuts in a container, adding salt water to the container in a quantity sufficient to cover the peanuts, closing and sealing the container, heating the container to boil the salt water while the container is maintained in a sealed condition for a sufficient length of time to cook the unshelled green peanuts, thereafter permitting the peanuts and salt water to cool and maintaining the cooked unshelled peanuts and salt water in said container while said container is maintained in a sealed condition until the peanuts are ready for consumption.

406J. Process of pretreating vegetable materials.

MUIDERBERG, L. V., AND JANSEN, A. W. Assignors to Central Bureau van de Tuinbouwveilingen in Nederland. 2515,025. July 11, 1950.

A method of blanching humid vegetable materials prior to their preservation comprising continuously circulating through the materials a closed humid air stream at a normal pressure which air stream has been heated to effect its dehumidification, humidifying the air stream by the moisture evaporated from the materials under treatment and controlling the heating and the humidification of continuous air stream to maintain its wet bulb temperature at a range between above 65° and below 100° C.

IOWA GROWS ONE-TENTH OF THE WORLD'S CORN

The USDA has just taken its annual look around the world, the *Bulletin* reminds us, to see how big the current global corn crop will be. Estimates of southern hemisphere corn, now being harvested, are added to known totals for the northern hemisphere in computing the 1949-50 world crop. To date, in that part of the world still outside the Iron Curtain and hence still open to the light of truth and the impartial appraisals of the statisticians, the picture looks like this:

North America	3,535,000,000 bushels
Europe	660,000,000 bushels
Asia	595,000,000 bushels
Africa	245,000,000 bushels
South America	365,000,000 bushels
Other	150,000,000 bushels
Total	5,550,000,000 bushels

Since Iowa's own native corn pickers threw some 553,847,000 bushels of corn into the world's hoppers last fall, the state must be credited with one-tenth of the total corn productivity of the globe.—(From the Corn Inds. Research Foundation's *Corn*, **6** [2], [1950].)

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Membership

Write to nearest regional secretary, if within an area covered by a regional section, or to the Executive Secretary of the Institute, for an application form and information regarding qualifications and classifications.

Regional Section News

(Continued from page 4 preceding technical papers)

"Recent Developments on Vitamin B_{12} and the Animal Protein Factor." G. P. Whitlock, Research Department, Merck and Co., Rahway, N. J.

The evening address was given by Herbert T. Holbrook, Sales Manager, Standard Cap and Seal Corporation, N. Y. His subject: "Recent Developments in Food Packaging." Prior to the evening meeting a dinner was held at the Country Club.

Those desiring to do so, were given the opportunity of visiting the Post and Kellogg plants.

PRESIDENT PAUL F. SHARP ANNOUNCES FURTHER COMMITTEES FOR THE YEAR

Some of the Committees appointed by President Sharp were listed in the August, 1950 issue. The following additional Committees have been recently announced:

1. *Committee on Food Industries Award:* Samuel C. Prescott, Chairman; E. A. Beavens, Clifford L. Bedford, W. V. Cruess, Howard C. Douglas, Arthur W. Farrall, C. R. Fellers, Ernest A. Fieger, William F. Geddes, David B. Hand, Ira A. Gould, Jr., B. L. Herrington, M. E. Highlands, Louis B. Howard, Walter A. Maclinn, John R. Matchett, Emil M. Mrak, John E. Nicholas, Milton E. Parker, Bernard E. Proctor, H. A. Schuette, John A. Shellenberger, George F. Stewart, Ernest H. Wiegand, Jasper G. Woodroof, W. R. Woolrich.

2. *Committee on Chemicals in Foods:* B. E. Proctor, Chairman; F. C. Blanck, Charles N. Frey, M. A. Joslyn, Charles W. Kaufman, Frank C. Lamb, Homer E. Whitmire.

3. *Committee on Citrus Products:* W. E. Baier, Chairman; E. A. Beavens, Charles H. Brokaw, E. J. Cameron, Horace Campbell, Raymond E. Cox, Adams W. Dutcher, Kenneth G. Dykstra, Ellis R. Fehlberg, John L. Heid, Chester W. Lindsay, Emil M. Mrak, William C. Platt, Vernon C. Praschan, Wallace R. Roy.

4. *Committee on Frozen Foods:* Ernest H. Wiegand, Chairman; H. C. Diehl, Wm. J. Finnegan, G. A. Fitzgerald, Louis B. Howard, Frank A. Lee, Herbert S. Madsen, Daniel G. Sorber, Gladys E. Vail, Jasper G. Woodroof.

5. *Committee on Pectin Standardization:* Dr. John J. Willaman, Chairman; George L. Baker, J. J. R. Bristow, Glenn H. Joseph, Charles Kaufman, Z. I. Kertesz, Louis J. Lataillade, W. D. Maclay, E. Everett Meschter, H. H. Mottern, Wm. A. Rooker, W. Lowe Walde.

6. *Committee on Taste Testing and Consumer Preference:* Dr. Emil M. Mrak, Chairman; E. C. Crocker, Harry L. Fevold, Helen Louise Hanson, Ernest E. Lockhart, Belle Lowe, Roy E. Morse, M. E. Pennington, Vernon M. White, Virgil O. Wodicka.

PERSONNEL

M. STANLEY BARKER of Magnus, Mabee and Reynard, Inc., prominent New York and Chicago essential oil, drug and chemical house, has been promoted to field sales supervisor of that company. Mr. Barker will supervise all sales for Metropolitan New York, New Jersey and Connecticut.

S. S. EPSTEIN, chemist, vice president, Kirsch's Beverages, Brooklyn, N. Y., is one of the recipients of this year's Chesterman Award, made by the American Bottlers of Carbonated Beverages, for outstanding contribution to the industry.

GEORGE GELMAN, Technical Director of the Quartermaster Food and Container Institute for the Armed

Regional Section News

Forces has resigned to accept appointment as Vice-President of the Vico Products Co., Chicago, manufacturers of yeast, yeast derivatives, hydrolysates and vitamins. Mr. Gelman received his bachelor's degree from the University of Chicago, and also a Master of Business Administration; he received his doctorate in jurisprudence from De Paul University. He was formerly staff chemist and bacteriologist, first with Wahl-Henius Insitute, Chicago, and later staff chemist and bacteriologist at the Edwal Laboratories, Chicago. A veteran of World War II, Mr. Gelman entered the service as a Second Lieutenant, Chemical Warfare Service, in 1942 and was assigned to the Quartermaster Food and Container Institute as assistant to the officer in charge of the Technical Branch, and later as officer in charge of planning. At his separation from the service he held the rank of major, QM-Reserve. He is a member of the American Chemical Society, a Fellow of the American Institute of Chemists, member of the Chicago Chemists Club, Institute of Food Ttechnologists and the American Association for the Advancement of Science.

WILLIAM R. JOHNSTON, formerly director of research, Standard Brands, has been appointed vice president in charge of research. Dr. Johnston received his bachelor's degree in 1930 from Washington State College (Seattle), and in 1933 his doctorate in physical chemistry from Johns Hopkins. He has been connected with Standard Brands since 1933.

CHARLES W. KAUFMAN has been appointed Executive Director of Research, Kraft Foods Co. His headquarters will be in Chicago at the main offices of Kraft. Mr. Kaufman, who has had broad experience in food research, will be responsible for the executive direction of all research activities of Kraft, including their new laboratories at Glenview, Illinois. A graduate of Washington and Lee University, Mr. Kaufman carried on graduate work at the University of California and the University of West Virginia. He is a member of the American Chemical Society, Institute of Food Technologists, Chemists Club of New York and the New York Academy of Sciences.

PERCY C. MAGNUS, president of Magnus, Mabee & Reynard, Inc., of New York, dealers in drugs, chemicals and essential oils, has been appointed chairman of the Essential Oils and Related Groups for the Greater New York Citizens Committee for the Hoover Report.

In this office he will enlist support to further the educational program for adoption of the recommendations of the bipartisan Hoover Commission for organization of the executive branch of the government.

JAMES MCGOWAN, JR., president, Campbell Soup Co., has been elected Chairman of the Board of that company.

ROY E. MARSHALL has been named Assistant Director, Michigan State College Agricultural Experiment Station, East Lansing.

ROY E. MORSE of Monsanto Chemical Company's food technology laboratory at Anniston, Ala., has been made research group leader of the laboratory. He will be in charge of the food technology and baking labora-

(Continued on page 17)

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N.C.A. "TOMATO PRODUCTS" BULLETIN IN NEW EDITION

The red booklet on "Tomato Products" (27-L) of the National Canners' Association has been for many years one of the most popular laboratory bulletins in the tomato processing industries. This publication played an important part in the general application and standardization of production and quality control methods. It is news, therefore, that a new revised edition of this bulletin has been just released by the Research Laboratories of N.C.A. The 80-page booklet now includes a section on tomato juice in addition to those dealing with tomato pulp or purée, tomato paste, catsup, and chili sauce.

W. D. Bigelow, H. R. Smith, C. A. Greenleaf, C. W. Bohrer and J. M. Reed are listed as authors in this edition.

Inquiries concerning the bulletin should be addressed to the National Canners' Association, 1133 20th Street, N. W., Washington 6, D. C.

NATIONAL SCIENTIFIC REGISTER

Did You Read Page 16 November Food Technology?

The questionnaire check list for Food Technologists was prepared by a committee of nine I. F. T. members headed by Dr. B. S. Clark. It has been approved by the National Research Council and Federal Security Agency, and has gone to the printer. Registration forms and check lists will be mailed to Food Technologists about January 15th. My office will mail questionnaires to all I. F. T. members in the U. S. Many I. F. T. members will receive other questionnaires because of membership in other societies. Each individual decides how he wishes to register, i.e., as a chemist, biologist, physicist, etc., or as a Food Technologist. Having decided upon the category in which you wish to register, disregard other questionnaires. DO NOT REGISTER MORE THAN ONCE. Registration is open to both men and women.

Minimum qualifications for registration with the National Scientific Register:

FOOD TECHNOLOGISTS: At least a Bachelor's degree from a recognized educational institution in Food Technology or one of the sciences or branches of engineering concerned with Food Technology, plus three years experience in the application of this training in some phase of Food Technology. (This includes teaching.) The requirement for formal academic training may be waived in the case of an individual who, through long experience, has distinguished himself in the field of Food Technology.

For the purpose of this registration, Food Technology is defined as the application of science and/or engineering to the production, processing, packaging, distribution, preparation, or utilization of foods.

Members should bring to the attention of fellow scientists and technologists who are not members of the Institute, the importance of this registration, and request them to print name and address on a penny post card and send to my office. They will be placed on the list to receive a questionnaire.

CHARLES S. LAWRENCE
Executive Secretary
176 W. Adams Street
Chicago 3, Illinois

Advertisers' Index

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FUTURE DATES FOR FOOD TECHNOLOGISTS

1951

February 11. Annual Meeting, National Egg Products Association, Kansas City, Mo.

February 17-23. Annual Convention, National Canners Association, National Food Brokers Association, Canning Machinery and Supplies Association, Chicago, Ill.

February 27-March 2. National Frozen Food Industry Convention, San Francisco, Calif.

May. International Canning Conference, Paris.

June 9-15. International Food Exposition, Chicago, Ill.

June 17-20. **Eleventh Annual Meeting, Institute of Food Technologists, New York, N. Y.**

August 2-September 11. Eighth International Congress of Refrigeration, London.

September 26-29. International Association of Milk and Food Sanitarians, Glenwood Springs, Colo.

(EDITOR'S NOTE: Starting with this issue, FOOD TECHNOLOGY will carry a list of future dates of national and international meetings, conventions, and exhibits of interest to food technologists. Information concerning such dates should be sent to the editor.)

FLAMMABLE OR INFLAMMABLE?

Considerable progress can be observed in the increasing acceptance of the term "flammable" in place of the older yet at times confusing expression "inflammable." Many organizations have now adopted "flammable" to designate materials that are easily ignited and burn with unusual rapidity.

As stated by the National Fire Protection Association in *Fire News*, the term "flammable" is used in place of inflammable in Chapter 39 of Public Law 772 (80th Congress, Section 835, Approved June 25, 1948, Effective September 1, 1948) with reference to Interstate Commerce Commission regulatory powers. The Civic Aeronautics Board also applied the word "flammable" in the text of a regulation in 1949.

NEW PRINCIPLE USED IN RECORDING HYGROMETER

An instrument recently produced by a London firm utilizes a novel method of dew-point measurement which enables it to operate automatically and continuously and to provide, if required, a continuous chart record of dewpoint. A particular value of this hygrometer is that it will measure very dry air with "dew-points" or frost-points much below 0° C. Two types are available, one for meteorological purposes and the other, which is of most interest to physicists and chemists, for industrial purposes, though both types are similar in principle.

A jet of air (or gas sample) is directed on the highly polished top surface of a thimble which is continuously cooled by contact with a copper block which forms part of a refrigerator system. Light from a lamp and lens system is directed obliquely on the top of the thimble. Dew formation is detected by two photocells, one adjacent to and illuminated by the lamp and the other so placed that it is unaffected by reflected light so long as the top of the thimble remains clear, but receives scattered light when dew or frost forms.

A thermocouple is embodied in the thimble and connected to a second magnetic amplifier from which sufficient power is derived to operate an indicating instrument and direct-writing recorder.

The entire appartus is self-contained and housed in a cabinet with its own refrigerator for cooling the copper block. Unit construction of the various components, such as amplifiers, and plug and socket connections, have been used throughout in the interests of simplified maintenance.—(From *World Refrig.*, **1** [1], 32, [1950].)

THE FISHING INDUSTRY IN BRAZIL

Fishing in Brazil is little developed as an industry, and is of relatively small economic importance. There is much subsistence fishing, wherever there is water; but fish is imported into all parts of Brazil, both canned and salted. The value of fish caught in Brazil in 1942 amounts to less than one-half of one percent of the Brazilian national income for 1942, and to about one-tenth of the value of U. S. fisheries products in 1939.

Primitive methods of fishing prevail throughout the country. The tropical coasts abound with fish, but the varieties are so numerous that large schools of a single species are rarely encountered; thus it is difficult if not impossible to employ large-scale methods. In the sub-tropical waters off the southern coasts, roughly from the Federal District to the Uruguayan border, it is possible to use the trawler and purse seine which are found so profitable in the northern oceans. Such an industry would be based on sardines and shrimp.

Efforts to develop the fishing industry during the past ten years have been sporadic and, usually, fruitless. The number of motor-powered fishing boats is small and so is the average horsepower of their engines. Few of them have any refrigerating equipment, and fuel is expensive.—(Fisheries Leaflet 329, from *Com. Fisheries Rev.*, **12** [6], 67 [1950]).

Regional Section News

(Continued from page 15)

tories. Dr. Morse was formerly professor of food technology at the University of Georgia.

George T. Peckham, Jr., Research Director, Clinton Industries, Clinton, Iowa, is the new chairman for the Division of Sugar Chemistry and Technology of the American Chemical Society.

B. E. Proctor, professor of food technology and Director, Samuel Cates Prescott Laboratories of Food Technology, Massachusetts Institute of Technology, is the new Chairman of the Division of Agricultural Chemistry of the American Chemical Society.

NECROLOGY

Benjamin Levin, bottler of carbonated beverages, died recently at Orlando, Florida.

John Joseph Austin, Jr., Secretary of the Northeast Section of the Institute for the past five years, died on April 2, 1950. He was 39 years old. Mr. Austin received his formal training at Lowell Textile Institute, Boston University and the Massachusetts Institute of Technology. He was associated with Dewey and Almy Chemical Co., until a few years ago when he started his own company, Austin Industries, at Sudbury, Mass. This company sold adhesives, plastics, machinery and many other materials required in packaging, and was becoming well known in the field of packaging development.

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WORLD WHEAT SITUATION

This summary statement is based on extracts from a paper on the world wheat situation prepared for the Third Session of the International Wheat Council, held in London in June 1950, by the Grain Section, Distribution Division, FAO and printed in the Monthly Bulletin of the FAO, Vol. 3, No. 7 (July) 1950.

The month of June is a difficult time to review the world wheat situation. June represents the closing period for one crop year, while it is still a little too early to say very much about the next crop season. At the same time, this period does have the unique advantage of offering an opportunity to look rather usefully both backward and forward, often making it possible to draw some tentative conclusions that may be kept in mind until later information is available.

1949-50 Season

Looking backward on the 1949-50 season, which is based statistically on a July-June year, these features may be noted: (1) the 1949 world wheat area and production, like those of 1948, were above the levels of prewar (1934-38), with many importing countries, in particular, showing good harvest results; (2) the volume of world trade in wheat and flour was substantially reduced from the record figure reached in 1948-49; (3) carry-over supplies in the United States of America on 30 June 1950 are expected to show some gain over a year ago, but there appears in prospect little change in the total for the other three major exporting countries (Canada, Australia, and Argentina); (4) the level of free wheat prices (in U. S. dollars) has shown little net change from a year earlier; and (5) the International Wheat Agreement of 1949, in active operation during most of the season, has made wheat and flour available to member importing countries at a maximum price substantially below free market prices.

1950-51 Season

Looking ahead to the coming year, what significant developments now appear to be in prospect? While still too early to give definite quantitative estimates on production, the following general conclusions may be assumed on the basis of current information:

World wheat production in 1950 will be below the levels reached in each of the past two years—1949 and 1948. The 1 June estimate of the U. S. winter wheat crop was placed at 710 million bushels (19.3 million m.t.) as compared with 902 million (24.5 million m.t.) a year ago and a preliminary forecast of spring wheat at 234 million bushels (6.4 million m.t.) is down from last year's out-turn of 245 million (6.7 million m.t.). If these estimates are maintained, they would represent a total decrease in the U. S. crop of some 203 million bushels from last year (370 million bushels from 1948), an amount that is so large in the world total that it would seem unlikely to be offset by any prospective increases elsewhere. The indicated U. S. decrease from last year is approximately equal to the total out-turn of Australia or Argentina. Even so, the United States is expected to harvest about an average crop. The new Canadian crop is off to a rather late start and some reduction in seedings has been reported. While some sections have had normal, or above normal, rainfall to date, large areas still report below normal fall and spring precipitation that will require timely seasonal rains for a normal harvest again this year.

Early reports from Europe indicate a small net gain in the wheat area, with prospects mostly favorable to date. Having in mind the above-average or record yields for many countries during the past two seasons, however, it still seems premature to estimate how much, if any, further gain in the European wheat total may be recorded. The Soviet Union has reported a progressively larger wheat harvest in recent years, the 1949 acreage being above prewar levels. Further increases will probably depend to a large extent upon yields, which in turn are associated with seasonal weather conditions. The history of Soviet wheat production is characterized by fluctuations in yield resulting from the weather factor. For Asia, generally good harvests are reported for India and Pakistan, and prospects are better than a year ago in Turkey. On the other hand, for China, the principal producing country, many unofficial reports are not very optimistic. Large areas are indicated to have been experiencing famine conditions this season and seeding operations have had to be carried on under many difficulties. In the Southern Hemisphere a larger area has been called for in Argentina, guaranteed prices to producers who work their own farms being advanced to 28 pesos per 100 kilos (US $2.27 per bu.) as compared with 23.5 pesos (US $1.90 per bu.) this season. Whether or not the total Hemisphere harvest will show an increase will depend upon yields in both Argentina and Australia; the latter country harvested a near record crop in 1949 and a return to more normal yields would offset a substantial increase in Argentina.

On the basis of present crop prospects in the United States and expected utilization for 1950-51, the carry-over on 1 July 1951 seems likely to be reduced somewhat, possibly below the 400 million bushel mark. Unless above-average crops are harvested in the other three major exporting countries, the total for the four countries can also be expected to show some net decline, leaving any further increase in surpluses dependent upon the 1951 harvest (or a later one).

A DIGEST OF LABORATORY SAFETY PRACTICES

Article by James S. Sweely, of the Sun Oil Co. Research Laboratory, Norwood, Pa. Published in *Chemical and Engineering News* **27**, 52, 3861 (1949). Abstracted by Martin Heerdt.

Goggles or eye shields should always be worn for personal protection in such operations as handling corrosive chemicals, explosives, vacuum distillations, high-pressure experiments, and shop work such as grinding. Rubber gloves and protective clothing are essential for work with corrosive chemicals; gas masks and respirators are necessary for hazardous atmospheres containing high concentrations of solvent vapors, dusts, and corrosive fumes.

Some precautions which can be recommended in the use of glass-

ware will reduce hazards to a minimum. Newly constructed glassware should be annealed and checked with polarized light before using, to detect dangerous strains. Tubing ends should be firepolished or ground and gloves used when inserting into stoppers. Avoid the use of cracked or chipped glassware, particularly flasks used in vacuum distillations. Glass tubes should extend well through rubber stoppers to avoid closure if the rubber swells. Heavy pieces of glass apparatus require the support of padded clamps and a ring stand or tripod.

For vacuum distillations a safety glass shield or protective screen as well as a large catch pan capable of holding the liquid volume involved should be used. Rubber stoppers used under vacuum must be large enough to prevent a suck-in. Vacuum dessicators as well as other vacuum equipment should be taped or suitably protected with shields. Permissible temperature and pressure ranges are necessary for safety in the use of such items as copper and saran tubing, iron pipe, metal cylinders, bombs, etc. Special precautions to be taken in the handling of compressed gas cylinders include hand truck transportation, use of the protective valve cap, vertical storage away from flammables, firm support, temperatures under 125° F., and use of a double valve pressure release device. Lubricants must not be used with oxygen valves; copper tubing should not be used with acetylene cylinders.

Good housekeeping has not been stressed sufficiently from the safety standpoint. Prompt cleanup of all spillages, keeping floors clear of samples, and disposal of broken apparatus all make for greater safety. Spilled mercury is very dangerous; all visible particles should be removed with a trapped suction device connected to an aspirator. The surrounding area should then be dusted with sulfur.

The usual precautions for handling reagents include working inside hoods with noxious materials; use of canvas bags or racks in transporting large bottles of acids, alkalies, etc.; prompt and proper labeling; and storage below eye level in the case of corrosive materials. Chemicals which are sufficiently hazardous to receive special mention can be classified as *corrosive chemicals* (acids, alkalies, aluminum chloride, hydrofluoric acid, phenol, phosphorus and phosphoric acids, sodium and potassium metal, and sulfonyl chloride), *poisons* (ammonia, aniline nitrobenzene, benzene, carbon disulfide, dimethyl sulfate, ether, fluorine, chlorine, bromine, iodine, hydrogen sulfide, hydrocyanic acid, cyanides, mercury, and phosgene) and *explosives* (chlorates, perchlorates, and benzoyl peroxide).

Several laboratories possess trained first aid squads composed of staff workers who handle all minor injuries on the spot. Fire drills, the correct manipulation of fire extinguishers, and the type of extinguisher to be used with various classes of fires should be a part of every safety training program. Smoking is usually permitted in designated areas except when flammables are being used. Safety matches are the only kind permitted in laboratories. At least two men are usually required to be in the laboratory if any experimental work is being done after the regular day. —*Commercial Fisheries Abstracts*, April, 1950.

WHAT'S THE TEMPERATURE?

Article by George E. Howard and E. J. Hanna of Application Engineering Department, Taylor Instrument Companies. Published in *National Provisioner* 122, 1, 14-15, 25 (January 7, 1950). Abstracted by Martin Heerdt.

The thermal or actuating system of a typical self-acting controller consists of three parts hermetically sealed together: the temperature-sensitive element or bulb, a capsular chamber or bellows, and the flexible tubing which joins them. The bulb is partially filled with a volatile liquid which when subjected to a temperature change produces pressure changes within the bellows, causing it to expand or contract. This movement is transmitted directly through a valve stem to the disc of the control valve which may be a single or double-sealed, direct or reverse-action valve.

Where more exact control of temperature is required, the use of an air-operated type of controller is necessary. Here the temperature-sensitive element actuates a small relay air valve which reduces a constant air supply of 20 to 25 pounds per square inch to some lower pressure depending on the temperature to which the bulb is subjected. This reduced presure is conveyed by copper tubing to the top of a diaphragm motor valve. The sensitivity of the air-operated controller may be changed by means of a simple adjustment to suit the requirements of the equipment being controlled. In summary, the air operated control system consists of the temperature controller which converts a change in temperature into a change in air pressure; and a diaphragm-operated control valve which functions in response to these pressure changes. A proportional response controller with automatic reset may be used in a continuous process. This type of controller corrects for load changes and returns the pen to the set point when such changes occur.

Self-acting controllers require maintenance. The packing in the valve stem stuffing box must be kept in good condition. When leaks cannot be stopped by a moderate amount of stuffing box nut adjustment, the valve should be repacked. Grease seal lubricators on valves so equipped should be given a one-quarter turn each week. If the packing is of the graphited rope type, the valve stem should be externally lubricated weekly with heavy oil. Preformed dry lubricated packing requires no auxiliary lubrication. The controller spring requires protection against external corrosion. Sharp bends in the connecting tubing must be avoided.

Procedure for repacking valves is as follows: Loosen the stuffing box nut, raise packing gland nut and remove all old packing. Use preformed graphite braided or a wick packing cut into short lengths equal to valve stem circumference; do not overpack. Now turn the stuffing box nut down as far as possible with the fingers and back it off slightly. Cause the stem to move up and down to check for free movement after repacking. If the valve is equipped with a grease seal lubri-

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What's the Temperature?

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cator and was originally supplied with a pre-formed ring type of dry lubricating packing, new packing of the same size should be substituted. This usually necessitates disconnecting the stem. For this operation count the exposed threads on the stem so that it can be replaced in the original position.

Leakage of a single-seated valve with removable composition disc can be corrected by inverting the disc or replacing it. To obtain best results in repairing a double-seated valve, heat the body and disc to operating temperature before grinding with an abrasive grinding compound. Care should be exercised in reassembling so that the valve stem is of the original length. If there is no movement of the valve stem when the bulb is subjected to temperatures 15 degrees F. above and below the temperature which the instrument is set to control, the thermal element itself is inoperative, in which instance the entire instrument should be returned to the manufacturer.—*Commercial Fisheries Abstracts*, May, 1950.

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